

Application Serial No. 10/802,439
Response dated April 27, 2006
Reply to Office Action dated February 27, 2006

REMARKS/ARGUMENTS

Applicants have received and carefully reviewed the final Office Action of the Examiner mailed February 27, 2006. Claims 1-34 remain pending. Reconsideration and reexamination are respectfully requested.

Rejections under 35 U.S.C. § 102(b)

In paragraph 2 of the Office Action, the Examiner rejected claims 1-3, 8-17, 33, and 34 under 35 U.S.C. §102(b) as anticipated by Hajny et al. (U.S. Patent No. 5,295,562). Applicant respectfully traverses the rejection. Hajny et al. appear to teach an air damper for use in duct work of an HVAC system (see column 1, lines 37-46). Hajny et al. do not appear to disclose a biasing mechanism that is adapted to close the valve stem within a time period that would cause water hammer in the fluid system, or a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. In response to Applicant's previous amendment and arguments, the Examiner acknowledges that Hajny et al. do not teach using the actuator for a water valve, but asserts that there is no structure on the Hajny et al. device that could prevent the using of it on a water valve, and that the claimed feature of using the actuator with a water valve is merely an intended use of the device.

Applicant submits that the above-recited claim elements are not merely intended use, but provide structure to the claimed elements. Claim 1 recites the biasing mechanism is adapted to close the valve stem within a time period that would cause water hammer in the fluid system. The structure of the biasing mechanism is expressed in terms of its function (the biasing mechanism has structure that closes the valve stem within a time period that would cause water hammer in the fluid system). There is no indication that the spring assembly 31 of Hajny et al. has a structure that would enable it to close a valve stem within a time period that would cause water hammer in a fluid system. In fact, water hammer is not a concern in the air duct system of Hajny et al.

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Claim 1 also recites a brake that increases the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. Like the biasing mechanism, the structure of the brake is expressed in terms of its function (the brake has structure that increases the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system). There is no indication in Hajny et al. that their centrifugal brake has a structure that would allow it to perform the claimed function.

The Examiner appears to be suggesting that because the structure of the actuator is claimed using functional language, the functional language is not entitled to any patentable weight. This is simply incorrect. With respect to functional language, MPEP § 2172.05(g) states:

2173.05(g) Functional Limitations [R-3]

A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971).

A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step.

(Emphasis Added). More particularly, *In re Swinehart* states:

We take the characterization “functional”, as used by the Patent Office and argued by the parties, to indicate nothing more than the fact that an attempt is being made to define something (in this case, a composition) by what it *does* rather than by what it *is* (as evidenced by specific structure or material, for example). In our view, there is nothing intrinsically wrong with the use of such a technique in drafting patent claims. Indeed we have even recognized in the past the practical necessity for the use of functional language.

(Emphasis Added) (*In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971)). As can be

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seen, the use of functional language is proper (and in some cases recognized as necessary), and such limitations must be evaluated and considered just like any other limitation of the claim. Moreover, and in the present case, the language the "the biasing mechanism is adapted to close the valve stem within a time period that would cause water hammer in the fluid system," and "a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system" must be evaluated and considered for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used.

Clearly, Hajny et al. do not disclose or suggest an actuator that has a biasing mechanism that is "adapted to close a valve stem within a time period that would cause water hammer in the fluid system". Likewise, Hajny et al. do not disclose or suggest "a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system". Instead, Hajny et al. appear to disclose an air damper for use in an air duct of an HVAC system. As noted above, water hammer is not of a concern in an air duct system, and is thus not related to a system in which water hammer could occur. In view of the foregoing, Hajny et al. clearly do not teach an actuator having each and every element as recited in the rejected claims.

The Examiner also asserts that there is no structure on Hajny et al.'s device that could prevent the using of it with a water valve. Applicant submits that this is not the standard for anticipation. MPEP 2131 states that, in order to anticipate a claim, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim.' Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." Applicant submits that Hajny et al. do not appear to teach each and every element as recited in independent claim 1 or the claims dependent thereon. Reconsideration and withdrawal of the rejection is respectfully requested.

Dependent claim 33 further recites that the brake increases the time period that the biasing mechanism closes the valve stem to 4 seconds or more. Such an extended time period would be desirable to reduce or eliminate water hammer in a fluid system, but would appear to

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be very long for an air damper application. The Examiner asserts that Hajny et al. teaches adjusting the brake to alter the braking effect, thereby changing the closing time of the valve so time required to close can be increased with alterations to the brake. The Examiner appears to be arguing that altering the device of Hajny et al. to achieve the claimed element would have been obvious. Applicant submits that such an argument is not proper in an anticipation rejection. Additionally, there is no motivation for one of ordinary skill in the art to modify the device of Hajny et al. to achieve the claimed device. Thus, for these additional and other reasons, dependent claim 33 is believed to be clearly patentable over Hajny et al.

Dependent claim 34 further recites that the brake is adapted to limit a rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, wherein the threshold speed is 900 RPMs or less. Hajny et al. do not appear to disclose such an element. Again, the Examiner points to a portion of Hajny et al. discussing in general ways the brake can be adjusted. As Hajny et al. do not appear to teach the specific elements of the claim, it seems the rejection is actually being made on grounds of obviousness. As stated above, there is no motivation for one of ordinary skill in the art to modify the system of Hajny et al. to achieve the brake as is recited in the claims. Thus, for these additional and other reasons, dependent claim 34 is believed to be clearly patentable over Hajny et al.

Regarding independent claim 9, Hajny et al. do not appear to teach or suggest a brake that is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs, as recited in claim 9. The Examiner asserts that Hajny et al. teach a brake that can be adjusted in many ways to alter the braking effect or to change the rotational velocity required to initiate braking, and that this changing of the braking changes the threshold rotation and limits the rotation of the output shaft of the motor to any desired value. Claim 9 recites a brake that is configured to limit the rotational velocity of the output shaft of the motor to a specific level of less than 1000 RPMs. There would appear to be no teaching in Hajny et al. of a brake having the specific configuration recited in claim 9.

Further, there is no motivation for one of ordinary skill in the art to modify the brake of Hajny et al. to achieve the specific rotational velocity limitation recited in the claim 9. The

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Examiner's statement that the changing of the braking in Hajny et al. limits the rotation to any desired value appears to be a statement of obviousness, which is improper in an anticipation rejection. Additionally, Applicants submit that there is no motivation, suggestion, or guidance for one to modify the actuator of Hajny et al. to achieve the specific rotational velocity limitation recited in claim 9. For these and other reasons, independent claim 9 and the claims dependent thereon are believed to be clearly patentable over Hajny et al. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 1, 2 and 4 are rejected under 35 U.S.C. §102(b) as anticipated by Weiss et al. (U.S. Patent No. 6,097,123). Applicant respectfully traverses this rejection. Like Hajny et al., Weiss et al. do not appear to teach or suggest a biasing mechanism that is adapted to close the valve stem within a time period that would cause water hammer in the fluid system, and a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. As discussed above, the limitations to independent claim 1 are not merely intended use, but rather impart structural requirements for performing certain functions. Weiss et al. do not appear to teach or suggest the claimed structural elements. For these and other reasons, independent claim 1, and the claims dependent thereon, are believed to be clearly patentable over Weiss et al. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 1-3 and 8 are rejected under 35 U.S.C. §102(b) as being anticipated by Persons (U.S. Patent No. 2,052,987). Applicant respectfully traverses this rejection. Persons appears to describe an electric valve control that is configured to prevent a valve from rebounding when closed. Applicant notes that preventing rebound of a valve upon closing is not equivalent to preventing water hammer in a fluid system. These are distinct problems. Persons do not appear to disclose a biasing mechanism that is adapted to close the valve stem within a time period that would cause water hammer in the fluid system, and a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. As discussed above, the limitations to independent claim 1 are not merely intended use, but impart structural requirements for performing certain functions. Persons does not appear to

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teach or suggest the claimed structural elements. For these and other reasons, independent claim 1, and the claims dependent therefrom, are believed to be clearly patentable over Persons. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 1-3, 8-25, 27-30, 33 and 34 are rejected under 35 U.S.C. § 102(e) as being anticipated by Min (US 2005/0092950). The Examiner asserts that Min discloses a motor brake structure for opening and closing a valve structure with the actuator assembly having a motor, a biasing mechanism for driving the valve stem in a direction opposite to the motor driving direction, and a brake that increases the time required for the closing of the valve by the biasing mechanism. Applicants respectfully traverse the rejection. As discussed above, the limitations to the independent claims are not merely intended use, but impart structural requirements for performing certain functions. Min does not appear to teach such structural elements.

Regarding independent claim 1, Min does not appear to disclose a biasing mechanism that is adapted to close a valve stem within a time period that would cause water hammer in the fluid system, and a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. Regarding independent claim 9, the Examiner asserts that Min teaches the rotational velocity of the motor shaft is limited by the brake and the brake can be altered to adjust the rotation speed of the motor. Applicants submit that Min's general teaching that the deformation degree of the brake 51 allowing the reverse rotation speed of the rotor 53 at the time of opening the valve 32 to be adjusted (see paragraph 0063) does not anticipate the claimed brake specifically configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs, as is recited in claim 9. At best, it appears the Examiner is asserting that modifying the Min device to achieve the claimed limitation would have been obvious, which is not a proper grounds for an anticipation rejection. Further, there is no motivation for one of ordinary skill in the art to modify the device of Min to have the claimed structural and functional characteristics recited in claim 9.

MPEP 2143.01 III states, "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the

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desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)... Although a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.' 916 F.2d at 682, 16 USPQ2d at 1432.)." Applicant submits that there is no motivation or suggestion in Min to modify the brake to have a configuration in which it limits the rotational velocity of the output shaft of the motor to less than 1000 RPMs, as is recited in claim 9. The Examiner's assertion that the brake of Min can be altered to adjust the rotation speed of the motor and increase the return time is not a proper grounds for anticipation and further, does not provide the required motivation for rendering the claimed invention obvious over Min. Min thus does not appear to teach or suggest each and every element of independent claim 9 or the claims dependent thereon.

Independent claim 21 recites, in part, an actuator assembly comprising a damping mechanism configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more. Independent claim 27 recites, in part, a damping mechanism for limiting rotational velocity of the motor when the one or more springs are driving the gear assembly to the closed position, wherein the damping mechanism is configured to limit the rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, wherein the threshold speed is 1000 RPMs or less. Min does not appear to disclose such elements. As with claim 9, the Examiner appears to be asserting that it would have been obvious to alter the brake of Min to achieve the claimed device. For similar reasons set forth with respect to claim 9, independent claims 21 and 27 and the claims dependent thereon are also believed to be clearly patentable over Min.

Independent claim 29 recites a method for reducing water hammer caused by operation of a valve involving, in part, the specific method step of moving the valve from the open position to the closed position in 4 seconds or more. As noted above with respect to claim 21, Min does not appear to disclose an element that performs the claimed method step. Additionally, claim 29 recites positive method steps that are not taught by Min. As stated above, MPEP 2143.01 III specifically states that the mere possibility that one could alter the device of Min to achieve the

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claimed method does not provide proper motivation for one to actually make such a change. Thus, for at least these reasons, independent claim 29 is believed to be clearly patentable over Min. For similar and other reasons, dependent claim 30 is also believed to be clearly patentable over Min. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 1 and 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Bucher (US 6,688,438). The Examiner asserts that Bucher teaches an actuator for an electric motor having a motor that operates a valve stem, a biasing mechanism (resetting spring) that closes the valve stem in a rapid movement and a brake in conjunction with a gearing 4 and transmission element 5 that slows the speed of the return of the valve element. Applicant respectfully traverses the rejection.

As discussed above, the limitations to the independent claims are not merely intended use, but impart structural requirements for performing certain functions. Bucher does not appear to teach such structural elements. Regarding independent claim 1, Bucher does not appear to disclose a biasing mechanism that is adapted to close a valve stem within a time period that would cause water hammer in the fluid system, and a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. Bucher thus does not appear to teach each and every element of independent claim 1 or the claims dependent thereon. Reconsideration and withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. § 103(a)

Claims 6 and 7 are rejected under 35 U.S.C. §103(a) as unpatentable over Hajny et al. in view of Pasch et al. Applicant respectfully traverses this rejection. As detailed above, independent claim 1, from which claims 6 and 7 depend, is distinguished from Hajny et al., and Pasch et al. does not appear to teach what Hajny et al. lack. Thus, for these and other reasons, dependent claims 6 and 7 are believed to be clearly patentable over Hajny et al. in view of Pasch et al.

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Claim 26 is rejected under 35 U.S.C. §103(a) as unpatentable over Min in view of Pasch et al.. Applicant respectfully traverses this rejection. As detailed above, independent claim 21, from which claim 26 depends, is distinguished from Min, and Pasch et al. does not appear to teach what Min lacks. Thus, for these and other reasons, dependent claim 26 is believed to be patentable over Min in view of Pasch et al.

Claims 31 and 32 are rejected under 35 U.S.C. §103(a) as unpatentable over Min. The Examiner asserts that Min discloses the structure of a motor assembly having a motor housing with an inside surface acted upon by a brake in order to slow the return speed of a biasing mechanism. The Examiner acknowledges that Min fails to teach replacing an old motor without a brake with a motor having a brake, but asserts that it would have been obvious to one of ordinary skill in the art to do so in order to better control the return speed of the valve and to prevent rebounding of the valve closure. Applicant respectfully traverses this rejection.

Claim 31 recites:

31. (Previously Presented) A method of reducing water hammer in a fluid system caused by a previously installed water valve assembly that includes a valve and an actuator assembly, the actuator assembly including a first motor adapted to move the valve from a first position to a second position, and a return mechanism that is configured to return the valve to the first position at a return speed; the method comprising steps of:

removing the actuator assembly; and
installing a replacement actuator assembly that includes a second motor
that includes a motor housing having an inside surface and a brake disposed in the motor housing, the brake being configured to engage at least part of the inside surface of the motor housing to slow the return speed of the second motor such water hammer is eliminated in the fluid system.

(Emphasis Added). As can be seen, claim 31 recites installing a replacement actuator assembly that includes a second motor with a brake, the brake being configured to engage at least part of the inside surface of the motor housing to slow the return speed of the second motor such water hammer is eliminated in the fluid system. Independent claim 32 also recites a method of reducing water hammer in a fluid system and includes the specific method steps of removing a

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first motor and installing a second motor that includes a brake configured to slow a return speed of the second motor.

Min does not appear to teach anything regarding replacing a motor. The Examiner asserts that it would have been obvious to replace a motor without a brake with a motor having a brake. This statement is not understood in view of the fact that the Examiner previously characterized Min as teaching a motor assembly having a brake. As Min already appears to teach an assembly including a motor and brake, the Examiner's statement regarding replacing a motor without a brake with respect to Min is not understood. If this rejection is maintained, Applicant respectfully requests the Examiner provide a more detailed explanation of the rejection.

Further, the Examiner's assertion that one would make the above modification to Min in order to better control the return speed of the valve and to prevent rebounding of the valve closure is not understood in light of the teachings of Min. Min do not appear to teach or suggest rebounding of the valve closure as a problem to be solved. In addition, and as noted above, preventing rebound of a valve upon closing is not equivalent to preventing water hammer in a fluid system. These are distinct problems. As no other prior art is being relied on for the rejection, it appears the Examiner has relied on Applicant's specification for the motivation for modifying the system of Min, which is improper. Min does not appear to teach or suggest each and every method step recited in independent method claims 31 and 32. Reconsideration and withdrawal of the rejection is respectfully requested.

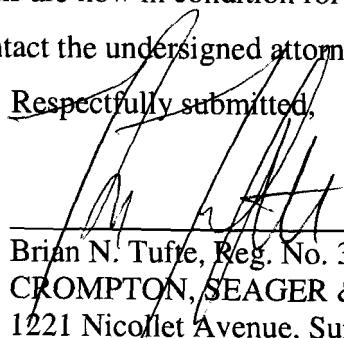
Claims 21-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Persons. It appears that claims 29 and 30 were also intended to be included in this rejection because they are discussed in the body of the rejection. Clarification of the rejection is requested.

Regarding independent claims 21 and 29, the Examiner acknowledges that Persons fails to teach a valve moving to a closed position in 4 seconds or more, but asserts that a person of ordinary skill in the art would increase the time required to close the valve in order to prevent rebounding of the valve member. Applicant respectfully traverses the rejection. Persons already teach a system that prevents rebounding by "properly proportioning the mass of the weights and

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the stiffness of the spring 42 the return speed of the valve can be so regulated as to prevent not only rebound but undue shock to the parts." See page 2, left column, lines 7-11. Because Persons has already provided a solution to the problem asserted by the Examiner, there is no motivation for one of ordinary skill in the art to further modify Persons to solve the same problem. In addition, preventing rebound of a valve upon closing is not equivalent to preventing water hammer in a fluid system. These are distinct problems. It appears that the motivation for further modification of Persons is found in Applicant's specification, which is improper. Persons thus does not appear to teach or suggest each and every method step of independent method claims 21 and 29, or the claims dependent thereon. Reconsideration and withdrawal of the rejection is respectfully requested.

Reconsideration and reexamination are respectfully requested. It is submitted that, in light of the above remarks, all pending claims are now in condition for allowance. If a telephone interview would be of assistance, please contact the undersigned attorney at 612-359-9348.


Respectfully submitted,

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